

Replacement Sheet

WHAT IS CLAIMED IS

1. A switching hub architecture comprising:
 - a plurality of ports for transferring packets;
 - a packet switching control unit for controlling a packet transfer procedure of each of the ports;
 - a microprocessor for processing packets received from each of the ports;
 - a packet transfer queue circuitry for temporarily storing the packet transfer queues between the microprocessor and the ports;
 - a packet register divided into a plurality of packet areas and being used for temporarily storing packets of each of the ports transferred during the packet transfer procedure; and
 - a packet index buffer for temporarily storing index data, wherein each of the indexes is used to indicate an unoccupied packet area in the packet register;wherein
 - during the packet transfer procedure, at least one of the packet switching control unit and the microprocessor is capable of accessing any one of the packet indexes stored in the packet index buffer, so as to transfer packets from the ports to be temporarily stored in the unoccupied packet area in the packet register indicated by the packet index accessed by the packet switching control unit or the microprocessor.
2. The switching hub architecture as claimed in claim 1, wherein the packet transfer procedure comprises a port-to-port packet transfer procedure, a port-to-microprocessor packet transfer procedure, and a microprocessor-to-port packet transfer procedure.

Replacement Sheet

3. An index-shared network packet transfer method, suitable for use in a switching hub consisting of a plurality of ports, a packet switching control unit, a packet index buffer, a packet transfer queue, a packet register, and a microprocessor and a data transfer interface thereof, allowing the packet transfer procedure to be carried out between the plurality of ports and the microprocessor; the method comprising the steps of:

(1) if a first port of the switching hub receives a packet, and the packet is to be transferred to a second port, then executing a port-to-port packet transfer procedure that comprises the following procedure steps:

(1-1) retrieving from the packet index buffer by the packet switching control unit a packet index which indicates an unoccupied packet area in the packet register;

(1-2) storing the packet received from the first port in the unoccupied packet area indicated by the packet index retrieved by the packet switching control unit;

(1-3) storing the packet index in a transfer queue of the second port by the packet switching control unit;

(1-4) transferring to the second port the packet within the packet register indicated by the packet index by the packet switching control unit, so as for the packet to be further transferred by the second port to a network node connected thereto;

(1-5) storing back the packet index to the packet index buffer by the packet switching control unit;

(2) if a port of the switching hub receives a packet, and the packet is to be transferred to the microprocessor, then executing a port-to-microprocessor packet transfer procedure that comprises the following procedure steps:

Replacement Sheet

(2-1) retrieving a packet index from the packet index buffer by the packet switching control unit, wherein the index indicates an unoccupied packet area in the packet register;

(2-2) storing the packet received from the port in the unoccupied packet area indicated by the packet index retrieved by the packet switching control unit;

(2-3) storing the packet index in a transfer queue of the microprocessor by the packet switching control unit;

(2-4) transferring the packet within the packet register indicated by the packet index to the microprocessor by the packet switching control unit;

(2-5) storing back the packet index to the packet index buffer by the packet switching control unit;

(3) if the microprocessor is to transfer the processed packet to a port, then executing a microprocessor-to-port packet transfer procedure that comprises the following procedure steps:

(3-1) retrieving a packet index from the packet index buffer by the microprocessor, wherein the packet index indicates an unoccupied packet area in the packet register;

(3-2) storing the processed packet by the microprocessor in the unoccupied packet area indicated by the packet index;

(3-3) storing the packet index in a transfer queue of the port by the microprocessor;

(3-4) transferring the processed packet within the packet register indicated to the port by the microprocessor so as for the processed packet to be transferred by the port to a network node connected thereto; and

(3-5) storing back the packet index *i* to the packet index buffer by the microprocessor.